

## NATURAL RESOURCES CONSERVATION SERVICE CONSERVATION PRACTICE STANDARD

### HERBACEOUS WIND BARRIERS

(feet)

#### CODE 422A

#### DEFINITION

Herbaceous vegetation established in rows or narrow strips across the prevailing wind direction.

#### PURPOSES

This practice may be applied as part of a Conservation Management System to support one or more of the following:

- Reduce soil erosion from wind.
- Protect growing crops from damage by wind borne soil particles.
- Manage snow to increase plant available moisture.
- Provide food and cover for wildlife.

#### CONDITIONS WHERE PRACTICE APPLIES

This practice applies to cropland, or other land where crops are grown.

This standard includes the location of herbaceous wind barriers and their management for identified uses. Criteria for the establishment of perennial herbaceous vegetation are in practice standards; Conservation Cover (327); Critical Area Planting (342); Pasture and Hayland Planting (512); and Range Planting (550); for establishing permanent vegetation. When woody plant materials are desired, refer to Hedgerow Planting (422), Tree/Shrub Establishment (612), and Windbreak/

Shelter Belt Establishment (650) in Section IV of the Field Office Technical Guide. Refer to Plant Materials Specialist, Plant Materials Center, accepted university or extension agronomy guides, or other accepted technical references for criteria to establish annual herbaceous vegetation.

#### CRITERIA

##### General Criteria Applicable to All Purposes Named Above

Current erosion, sediment, and/or residue prediction technology such as Revised Universal Soil Loss Equation (RUSLE), Wind Erosion Equation (WEQ), Surface Irrigation Soil Loss Model (SISL), will be used to evaluate acceptable crop rotations, tillage sequences, residue orientation, and erosion rates of the practices and systems evaluated.

The Soil Conditioning Index will be used to determine the impacts of the system on soil organic matter content and tilth.

Evaluations will include appropriate support practices to achieve the desired erosion level of treatment for the program being planned, or for a Resource Management System (RMS).

Barriers may consist of perennial or annual plants, growing or dead. Plant

materials shall be selected for the following characteristics:

- Adaptation to the site.
- Erect non-spreading growth habit.
- Resistant to lodging.
- Good leaf retention.
- Minimum competition with adjacent crops.

Barriers may consist of one row of plants, providing the required density can be achieved with a single row, and that the row contains no gaps.

Where two or more rows are needed to achieve the required density and to avoid gaps, the rows shall be spaced no more than 36 inches apart.

#### **Additional Criteria to Reduce Soil Erosion from Wind**

Barriers designed for this purpose shall have a minimum expected height of 1.5 feet during the wind erosion period for which the barriers are designed.

Barriers established for this purpose shall be designed to achieve a density of 50-60 percent.

The spacing between barriers shall be measured along the prevailing wind direction during those periods when wind erosion is expected to occur. Spacing shall not exceed 15 times the expected height of the barrier plus additional width permitted by the soil loss tolerance (T), or other planned soil loss objective.

The effective spacing between barriers shall be determined using current approved wind erosion prediction technology. Calculations shall account

for the effects of other practices in the Conservation Management System.

#### **Additional Criteria to Protect Growing Crops from Damage from Wind-borne Soil Particles**

Barriers designed for this purpose shall have a minimum expected height of 2 feet during those periods when growing crops are susceptible to damage by blowing wind or wind-borne soil particles.

Barriers established for this purpose shall be designed to achieve a density of 50-60 percent during the period when growing crops are to be protected.

When barrier direction deviates from perpendicular to the prevailing wind erosion direction, the spacing between barriers shall be correspondingly reduced.

The spacing between barriers shall be measured along the prevailing wind erosion direction during those periods when sensitive crops are susceptible to damage by wind-borne soil particles. Spacing shall not exceed 15 times the expected height of the barrier plus additional width permitted by the crop tolerance to wind erosion as specified in applicable Field Office Technical Guides, other accepted technical references, or other planned crop protection objective.

The spacing between barriers shall be determined using current approved wind erosion prediction technology to estimate wind erosion during specific crop stage periods. Calculations shall account for the effects of other practices in the conservation management system.

### **Additional Criteria to Manage Snow to Retain Additional Soil Moisture**

Barriers designed for this purpose shall have a minimum expected height of 1.5 feet during periods of expected snow cover.

Barriers established for this purpose shall be designed to achieve a density of 25-40 percent during periods of expected snow cover.

The effective spacing shall be measured along the direction of prevailing winds during periods of expected snow cover. For uniform distribution of drifting snow, spacing shall not exceed 12 times the expected height of the barrier.

### **Additional Criteria to Provide Food and Cover for Wildlife**

Barriers established for this purpose shall consist of plants that provide food and cover for the targeted wildlife species.

Barriers established for this purpose shall have a minimum width of two feet.

Barriers established for this purpose shall have a minimum expected height that provides adequate cover for the targeted wildlife species.

### **CONSIDERATIONS**

Individual conservation practices should be planned as part of a comprehensive conservation plan which addresses all resource concerns on the unit and reaches a RMS level of treatment.

Transport of wind-borne sediment and sediment-borne contaminants offsite are

reduced by this practice when used in a Conservation Management System.

Herbaceous wind barriers are more suitable than field windbreaks for use under center pivot irrigation systems due to height considerations. Windbreaks may be located outside the windward edge of the circle.

Spacing between barriers may be adjusted, within the limits of the criteria above, to accommodate widths of farm equipment to minimize partial or incomplete passes.

Selection of plants for use in barriers should favor species or varieties tolerant to herbicides used on adjacent crops.

Plants, which may be alternate hosts for pests injurious to adjacent crops, should not be selected for use in barriers.

Selection of plant species less palatable to animals may reduce damage to barriers and crops from grazing wildlife.

Where water erosion from melting snow, accumulated within the barrier system, is a concern, the hazard can be reduced by supporting erosion control practices, such as, Residue Management (329 and 344). Where feasible, aligning barriers across the slope can enhance moisture infiltration and reduce erosion.

When barriers are designed to enhance wildlife habitat, plant species diversity should be encouraged. The use of evergreens in barriers designed to provide winter cover may increase their value. Barriers that result in multiple structural levels of vegetation within the barrier will maximize wildlife use.

Some plants are damaged by blowing wind as well as by wind-borne soil particles. In such cases, the spacing between wind barriers may have to be reduced from that obtained using wind erosion prediction technology.

## **PLANS AND SPECIFICATIONS**

Site specific specifications are developed by the planner for each land unit being planned. Site specific specifications are developed using current predication models and tools. i.e: RUSLE, WEQ, Surface Irrigation Loss Model (SISL), Soil Condition Index Rating.

Specifications shall be recorded using approved specification sheets, job sheets, narrative statements in the conservation plan, or other acceptable documentation.

## **OPERATION AND MAINTENANCE**

Annual maintenance of this practice may be required by certain program or contractual agreements.

Annual barriers shall be reestablished each year by planting at recommended dates. Leave rows standing through the critical erosion period, or until seedbed preparation. Leave standing strips when tilling previous crops.

After establishment, perennial barriers shall be fertilized at the same time and rate as adjacent field crops, or as needed by the barriers. Weeds shall be controlled with cultivation, mowing, chemicals, or other acceptable methods.

Harvest of hay or seed from perennial barriers, grazing, or mowing for weed control, shall be managed to allow regrowth to the planned height before

periods when wind erosion, crop damage, or drifting snow are expected to occur. Annual barriers may be grazed or harvested after critical periods have passed.

Wind-borne sediment accumulated in barriers shall be removed and distributed over the surface of the field as determined appropriate.

Barriers shall be re-established or relocated as needed.

Barriers designed to enhance wildlife habitat should not be mowed or pruned unless their height or width exceeds that required to achieve the wildlife objective and they become competitive with the adjoining land use. When mowing or pruning is necessary, it shall be done during the non-nesting season or winter cover season.

## **REFERENCES**

Section 1, Erosion Prediction, Idaho Field Office Technical Guide.